

## I CLAIM:

1           1. A separation nut to provide internal threads for an  
2           externally threaded bolt, which when tightened together develop  
3           an axial tensile load, and which requires an axial separation  
4           force for release of the bolt, said separation nut having a  
5           central axis and comprising:

6                 a base having an opening to pass a bolt, and a  
7           peripheral sliding surface surrounding said opening;

8                 a rotor having a central axial passage, a sliding  
9           surface contiguous to the sliding surface on the base, and a  
10          plurality of ramp-like surfaces surrounding said passage facing  
11          away from said sliding surface disposed at a non-locking ramp  
12          angle, a peripheral outer wall, and a plurality of recesses in  
13          said outer wall;

14                a stator having a central axial passage, and a  
15          plurality of ramp-like surfaces complementary to the ramp-like  
16          surfaces on said rotor and in surface-to-surface contact with  
17          them, a skirt surrounding and in contact with the outer wall of  
18          said rotor, said skirt being pierced by a plurality of windows  
19          opening onto the outer wall of said rotor and axially aligned  
20          with said recesses, and a peripheral abutment surface on said  
21          stator surrounding its central passage facing away from its said  
22          ramp surfaces, said stator being restrained from rotation, but  
23          able to move axially;

24           a control ring embracing said stator, said control ring  
25 being rotatable around said central axis, a backing surface in  
26 contact with said skirt having relief ports disposed so as to be  
27 alignable with the windows in said skirt and movable out of  
28 alignment with them, said rotor and stator together forming a  
29 relief element;

30           a plurality of bearings each disposed in a respective  
31 window in said stator, and proportioned to extend between said  
32 rotor and stator to bridge them and hold the rotor against  
33 rotation in one rotational position of said control ring, and to  
34 extend into a relief port in said control ring in another  
35 rotational position of the control ring so as to bridge said  
36 stator and control ring, but to leave said rotor free to rotate  
37 relative to the stator;

38           an actuator interposed between said base and said  
39 control ring adapted to rotate said control ring to align said  
40 windows and relief ports;

41           a key seat having a central passage having a bearing  
42 surface bearing against said stator, keyed against rotation and  
43 having a tapered expansion face and a bias bearing face;

44           a segment locking ring having a central opening defined  
45 by a cylindrical locking surface, and a bias bearing face;

46           a compression spring disposed between said bias bearing  
47 race on said key seat and said bias bearing face on said segment

48 locking ring biasing said segment locking ring axially away from  
49 said relief element;

50 a plurality of axially extending nut segments each  
51 bearing a portion of the same thread, said segments being  
52 assembleable around said central axis, each segment having an  
53 arcuate outer wall which is a segment of a same cylinder which  
54 when assembled will have a circumference contiguously embraced by  
55 the cylindrical locking surface in said locking ring, each said  
56 segment having a tapered surface at each of its axial ends, and a  
57 relieved portion adjacent to said arcuate wall;

58 an axially movable separator axially aligned with said  
59 segments and in contact with one of the separation surfaces of  
60 each of said segments; and

61 a separation spring compressed between said housing and  
62 said separator, whereby to exert a separative radial force to  
63 remove said segments from the thread of a bolt after the rotor is  
64 permitted to rotate.

1 2. A separation nut according to claim 1 in which said  
2 actuator is a linear actuator.

1 3. A separation nut according to claim 2 in which said  
2 actuator is an electrically powered motor.

1           4. A s paration nut according to claim 2 in which said  
2 motor is a solenoid.

1           5. A separation nut according to claim 2 in which said  
2 actuator is a spring biased plunger.

1           6. A separation nut according to claim 1 in which said  
2 springs are wave springs.

1           7. A separation nut according to claim 1 in which an access  
2 port gives access to the inside of the housing to hold the  
3 segment locking ring against the arcuate outer walls of the  
4 segments until a bolt engaged to the segments will hold the  
5 separation nut against separation until after actuation.